

$1.5 < f/EPD < 2.1$ [Conditional Expression 9]

$0.4 < (t1+t2)/t3 < 1.3$ [Conditional Expression 10]

$0 < |n1 - n2| < 0.25$ [Conditional Expression 11]

[0095] In an example, f is an overall focal length of the optical imaging system, $2Y$ is a diagonal length of an imaging plane, Y is $1/2$ of $2Y$, θ is equal to half a field of view of the optical imaging system, $R1$ is a radius of curvature of the object-side surface of the first lens, $R2$ is a radius of curvature of an image-side surface of the first lens, $f1$ is a focal length of the first lens, $f3$ is a focal length of the third lens, $f6$ is a focal length of the sixth lens, EPD is an entrance pupil diameter (EPD), $t1$ is a thickness at an optical axis center of the first lens, $t2$ is a thickness at an optical axis center of the second lens, $t3$ is a thickness at an optical axis center of the third lens, $n1$ is a refractive index of the first lens, and $n2$ is a refractive index of the second lens.

[0096] The optical imaging system satisfying the above Conditional Expressions 1 through 11 may be miniaturized, and may allow high resolution images to be realized.

[0097] Next, optical imaging systems, according to several embodiments, will be described.

[0098] An optical imaging system, according to a first embodiment, will be described with reference to FIG. 1.

[0099] The optical imaging system 100, according to the first embodiment, includes an optical system including a first lens 110, a second lens 120, a third lens 130, a fourth lens 140, a fifth lens 150, and a sixth lens 160.

[0100] The optical imaging system 100 includes a filter 170, an image sensor 180, and a stop ST. The filter 170 is disposed between the sixth lens 160 and the image sensor 180, and the stop ST is disposed between the second lens 120 and the third lens 130.

[0101] In an embodiment, the first lens 110 has a negative refractive power, and an object-side surface thereof is concave and an image-side surface thereof may be convex. The second lens 120 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. The third lens 130 has a positive refractive power, and an object-side surface and an image-side surface thereof are convex. The fourth lens 140 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. The fifth lens 150 has a positive refractive power, and an object-side surface thereof is convex and an image-side surface thereof is convex. The sixth lens 160 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. In addition, inflection points are formed on both surfaces of the sixth lens 160.

[0102] The optical imaging system configured as described above may represent aberration characteristics as illustrated in FIG. 2. FIGS. 3 and 4 are tables displaying characteristics of lenses and aspherical characteristics of the optical imaging system, according to the first embodiment.

[0103] An optical imaging system, according to a second embodiment, will be described with reference to FIG. 5.

[0104] The optical imaging system 200, according to the second embodiment, includes an optical system including a first lens 210, a second lens 220, a third lens 230, a fourth lens 240, a fifth lens 250, and a sixth lens 260.

[0105] The optical imaging system 200 includes a filter 270, an image sensor 280, and a stop ST. The filter 270 is

disposed between the sixth lens 260 and the image sensor 280, and the stop ST is disposed between the second lens 220 and the third lens 230.

[0106] In an embodiment, the first lens 210 has a negative refractive power, and an object-side surface thereof is concave and an image-side surface thereof may be convex. The second lens 220 has a negative refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. The third lens 230 has a positive refractive power, and an object-side surface and an image-side surface thereof are convex. The fourth lens 240 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. The fifth lens 250 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. The sixth lens 260 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. In addition, inflection points are formed on both surfaces of the sixth lens 260.

[0107] The optical imaging system configured as described above may represent aberration characteristics as illustrated in FIG. 6. FIGS. 7 and 8 are tables displaying characteristics of lenses and aspherical characteristics of the optical imaging system, according to the second embodiment.

[0108] An optical imaging system, according to a third embodiment, will be described with reference to FIG. 9.

[0109] The optical imaging system 300, according to the third embodiment, includes an optical system including a first lens 310, a second lens 320, a third lens 330, a fourth lens 340, a fifth lens 350, and a sixth lens 360.

[0110] The optical imaging system 300 includes a filter 370, an image sensor 380, and a stop ST. The filter 370 is disposed between the sixth lens 360 and the image sensor 380, and the stop ST is disposed between the second lens 320 and the third lens 330.

[0111] In an embodiment, the first lens 310 has a negative refractive power, and an object-side surface thereof is concave and an image-side surface thereof may be convex. The second lens 320 has a negative refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. The third lens 330 has a positive refractive power, and an object-side surface and an image-side surface thereof are convex. The fourth lens 340 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. The fifth lens 350 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. The sixth lens 360 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. In addition, inflection points are formed on both surfaces of the sixth lens 360.

[0112] The optical imaging system configured as described above may represent aberration characteristics as illustrated in FIG. 10. FIGS. 11 and 12 are tables displaying characteristics of lenses and aspherical characteristics of the optical imaging system, according to the third embodiment.

[0113] An optical imaging system, according to a fourth embodiment, will be described with reference to FIG. 13.

[0114] The optical imaging system 400, according to the fourth embodiment, includes an optical system including a